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09/990,126	11/21/2001	Sean B. Simmons	555255012296	2794

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EXAMINER

PHAM, TUAN

ART UNIT	PAPER NUMBER
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2643

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/990,126

Applicant(s)

SEAN SIMMONS

Examiner

TUAN A PHAM

Art Unit

2643

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 19-21, 28-33, 36, 40-42 and 44-49 is/are rejected.
- 7) ☒ Claim(s) 8-18, 22-27, 34, 35, 37-39 and 43 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1, 7, 20-21, 30-33, 36, 40-42, 45-46, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poirier et al. (U.S. Patent No.: 6,625,433, hereinafter, "Poirier").

Regarding claims 1, 21, 31, 46 and 49, Poirier teaches a signal receiver and method comprising (see figure 1):

a primary signal input configured to receive an input signal having a first signal dynamic range (see figure 1, input signal analog RF, col.5, ln.46-57), an intermediate signal output configured to provide a scaled signal representative of the input signal

(see figure 1, 1st IF output at filter 110, col.5, ln.39-46), a primary variable-gain amplifier coupled to the signal input and the intermediate signal output (see figure 1, VGA 112, col.5, ln.58-67), and a gain controller coupled to the primary amplifier and configured to control a gain applied by the primary amplifier to maintain the scaled signal within a second signal dynamic range (see figure 1, micro controller 105, col.7, ln.7-37); and

a secondary signal input coupled to the intermediate signal output (see figure 1, IF input at VGA 115), a final signal output configured to provide an output signal representative of the input signal (see figure 1, final output at VGA 115), a secondary variable-gain amplifier coupled to the intermediate signal output and the final output (see figure 1, VGA 115, col.5, ln.58-67), and a gain controller coupled to the secondary amplifier (see figure 1, micro controller 105, col.7, ln.7-37) and configured to control a gain of the secondary amplifier to set the gain of the secondary amplifier to a first gain value when a parameter associated with the scaled signal exceeds a threshold value, and to set the gain of the secondary amplifier to a second gain value different from the first gain value when the signal parameter is less than the threshold value (see col.10, ln.1-23).

It should be noticed that Poirier fails to clearly teach the primary and secondary gain controller separately. However, Poirier teaches the micro controller for controlling gain signal of amplifier (see figure 1, microcontroller 105, col.7, ln.7-37) for a purpose of controlling gain of receiver.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of micro controller, into view of Poirier in order to save cost and space in the communication devices.

Regarding claim 7, Poirrier further teaches the signal receiver wherein the secondary gain controller comprises a threshold detector configured to determine whether the parameter is above or below the threshold and to set the gain of the secondary amplifier to the first gain value or the second gain value (see col.9, ln.15-35, col.10, ln.1-23).

Regarding claims 20 and 30, Poirrier further teaches the signal receiver further comprising receiver components coupled to the final signal output and configured to perform further processing operations on the output signal from the secondary processing stage (see figure 1, final output to baseband signal).

Regarding claim 32, Poirrier further teaches the method wherein the step of controlling the first controlled gain comprises the steps of: estimating one of the signal power or signal amplitude of the scaled signal; and providing a first gain control value inversely proportional to the signal power or signal amplitude of the scaled signal to control the first controlled gain (see col.7, ln.8-50).

Regarding claim 33, Poirrier further teaches the method wherein the step of providing a first gain control value comprises calculating the first gain control value using the signal power or signal amplitude of the scaled signal and an automatic gain control (AGC) algorithm (see col.10, ln.8-65).

Regarding claim 36, Poirrier further teaches the method wherein the steps of controlling the first controlled gain, applying the second controlled gain, and controlling the second controlled gain are substantially performed in a digital signal processor (DSP) (see figure 1, micro controller 105, col.7, ln.8-37).

Regarding claim 40, Poirrier further teaches the method wherein the signal receiver is implemented in a communication device selected from the group consisting of a mobile communication device, a personal digital assistant (PDA), a cellular telephone, a two-way pager, and a wireless modem (see col.4, ln.39-50).

Regarding claim 41, Poirrier further teaches the method wherein the step of applying a second controlled gain to the scaled signal comprises the steps of: applying an inverse of the first controlled gain to the scaled signal to provide a full dynamic range output signal having the first signal dynamic range; and applying the second controlled gain to the full dynamic range signal (see col.7, ln.8-37).

Regarding claim 42, Poirrier further teaches the method wherein the step of controlling the second controlled gain comprises: estimating one of the signal power and the signal amplitude of the full dynamic range signal; and calculating the parameter using the signal power or signal amplitude of the full dynamic range signal (see col.7, ln.25-67).

Regarding claim 45, Poirrier further teaches the method wherein: the steps of applying a first controlled gain and controlling the first controlled gain comprise an automatic gain control (AGC) method; the step of applying an inverse of the first controlled gain to the scaled signal comprises an inverse AGC method; and the steps of

Art Unit: 2643

applying a second controlled gain and controlling the second controlled gain comprise a soft limiting method (see col.7, ln.8-50).

3. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poirier et al. (U.S. Patent No.: 6,625,433, hereinafter, "Poirier") in view of Bizjak et al. (Pub. No.: U.S. 2003/0035549, hereinafter, "Bizjak").

Regarding claim 2, Poirier teaches a signal receiver and method comprising (see figure 1):

a primary signal input configured to receive an input signal having a first signal dynamic range (see figure 1, input signal analog RF, col.5, ln.46-57), an intermediate signal output configured to provide a scaled signal representative of the input signal (see figure 1, 1st IF output at filter 110, col.5, ln.39-46), a primary variable-gain amplifier coupled to the signal input and the intermediate signal output (see figure 1, VGA 112, col.5, ln.58-67), and a gain controller coupled to the primary amplifier and configured to control a gain applied by the primary amplifier to maintain the scaled signal within a second signal dynamic range (see figure 1, micro controller 105, col.7, ln.7-37); and

a secondary signal input coupled to the intermediate signal output (see figure 1, IF input at VGA 115), a final signal output configured to provide an output signal representative of the input signal (see figure 1, final output at VGA 115), a secondary variable-gain amplifier coupled to the intermediate signal output and the final output (see figure 1, VGA 115, col.5, ln.58-67), and a gain controller coupled to the secondary amplifier (see figure 1, micro controller 105, col.7, ln.7-37) and configured to control a

Art Unit: 2643

gain of the secondary amplifier to set the gain of the secondary amplifier to a first gain value when a parameter associated with the scaled signal exceeds a threshold value, and to set the gain of the secondary amplifier to a second gain value different from the first gain value when the signal parameter is less than the threshold value (see col.10, ln.1-23).

It should be noticed that Poirier fails to clearly teach the signal receiver wherein the primary gain controller comprises: a power estimator comprising an input coupled to the intermediate signal output and an output configured to provide an indication of one of the signal power or signal amplitude of the scaled signal; and an inverter (i.e., gain calculate) comprising an input coupled to the power estimator output and an output coupled to the primary amplifier, and configured to provide a primary gain control value inversely proportional to the signal power or signal amplitude of the scaled signal to control the gain applied by the primary amplifier. However, Bizjak teaches such features (see figure 2, col.2, [0010]) for a purpose of estimating the gain of amplifier.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of a power estimator comprising an input coupled to the intermediate signal output and an output configured to provide an indication of one of the signal power or signal amplitude of the scaled signal; and an inverter (i.e., gain calculate) comprising an input coupled to the power estimator output and an output coupled to the primary amplifier, and configured to provide a primary gain control value inversely proportional to the signal power or signal amplitude of the scaled

signal to control the gain applied by the primary amplifier, as taught by Bizjak, into view of Poirier in order to improve noise level in communication system.

Regarding claim 3, Poirier teaches a signal receiver and method comprising (see figure 1):

a primary signal input configured to receive an input signal having a first signal dynamic range (see figure 1, input signal analog RF, col.5, ln.46-57), an intermediate signal output configured to provide a scaled signal representative of the input signal (see figure 1, 1st IF output at filter 110, col.5, ln.39-46), a primary variable-gain amplifier coupled to the signal input and the intermediate signal output (see figure 1, VGA 112, col.5, ln.58-67), and a gain controller coupled to the primary amplifier and configured to control a gain applied by the primary amplifier to maintain the scaled signal within a second signal dynamic range (see figure 1, micro controller 105, col.7, ln.7-37); and

a secondary signal input coupled to the intermediate signal output (see figure 1, IF input at VGA 115), a final signal output configured to provide an output signal representative of the input signal (see figure 1, final output at VGA 115), a secondary variable-gain amplifier coupled to the intermediate signal output and the final output (see figure 1, VGA 115, col.5, ln.58-67), and a gain controller coupled to the secondary amplifier (see figure 1, micro controller 105, col.7, ln.7-37) and configured to control a gain of the secondary amplifier to set the gain of the secondary amplifier to a first gain value when a parameter associated with the scaled signal exceeds a threshold value, and to set the gain of the secondary amplifier to a second gain value different from the

first gain value when the signal parameter is less than the threshold value (see col.10, ln.1-23).

It should be noticed that Poirier fails to clearly teach an amplitude calculator (i.e., power estimator) comprising an input coupled to the intermediate signal output and an output configured to provide an indication of the signal amplitude of the scaled signal; and a gain calculator comprising an input coupled to the amplitude calculator output and an output coupled to the primary amplifier, and configured to calculate a primary gain control value using the indication of the amplitude of the scaled signal to control the gain applied by the primary amplifier. However, Bizjak teaches such features (see figure 2, col.2, [0010]) for a purpose of estimating the gain of amplifier.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of an amplitude calculator (i.e., power estimator) comprising an input coupled to the intermediate signal output and an output configured to provide an indication of the signal amplitude of the scaled signal; and a gain calculator comprising an input coupled to the amplitude calculator output and an output coupled to the primary amplifier, and configured to calculate a primary gain control value using the indication of the amplitude of the scaled signal to control the gain applied by the primary amplifier, as taught by Bizjak, into view of Poirier in order to improve noise level in communication system.

Regarding claim 4, Bizjak further teaches the signal receiver wherein the gain calculator calculates the primary gain control value using the indication of the amplitude of the scaled signal and an automatic gain control (AGC) algorithm (see col.23, [0322]).

Regarding claim 5, Poirier further teaches the signal receiver wherein the primary gain control value is a value of the gain applied by the primary amplifier (see col.7, ln.8-36).

4. Claims 19, 28-29, and 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poirier et al. (U.S. Patent No.: 6,625,433, hereinafter, "Poirier") in view of Vu et al. (U.S. Patent No.: 6,002,925, hereinafter, "Vu").

Regarding claims 19 and 29, Poirier teaches a signal receiver and method comprising (see figure 1):

a primary signal input configured to receive an input signal having a first signal dynamic range (see figure 1, input signal analog RF, col.5, ln.46-57), an intermediate signal output configured to provide a scaled signal representative of the input signal (see figure 1, 1st IF output at filter 110, col.5, ln.39-46), a primary variable-gain amplifier coupled to the signal input and the intermediate signal output (see figure 1, VGA 112, col.5, ln.58-67), and a gain controller coupled to the primary amplifier and configured to control a gain applied by the primary amplifier to maintain the scaled signal within a second signal dynamic range (see figure 1, micro controller 105, col.7, ln.7-37); and

a secondary signal input coupled to the intermediate signal output (see figure 1, IF input at VGA 115), a final signal output configured to provide an output signal representative of the input signal (see figure 1, final output at VGA 115), a secondary variable-gain amplifier coupled to the intermediate signal output and the final output (see figure 1, VGA 115, col.5, ln.58-67), and a gain controller coupled to the secondary

Art Unit: 2643

amplifier (see figure 1, micro controller 105, col.7, ln.7-37) and configured to control a gain of the secondary amplifier to set the gain of the secondary amplifier to a first gain value when a parameter associated with the scaled signal exceeds a threshold value, and to set the gain of the secondary amplifier to a second gain value different from the first gain value when the signal parameter is less than the threshold value (see col.10, ln.1-23).

It should be noticed that Poirier fails to clearly teach an antenna configured to receive communication signals, a first filter stage coupled to the antenna, a frequency converter coupled to the filter stage, and a second filter stage coupled to the frequency converter, an output of the frequency converter coupled to the signal input of the primary signal processor. However, Vu teaches such features (see figure 1, first filter stage BPF 20, low noise amplifier 40, second filter stage LPF 45, col.14, ln.8-49) for a purpose of receiving the input signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of an antenna configured to receive communication signals, a first filter stage coupled to the antenna, a frequency converter coupled to the filter stage, and a second filter stage coupled to the frequency converter, an output of the frequency converter coupled to the signal input of the primary signal processor, as taught by Vu, into view of Poirier in order to convert the RF signals to IF signals.

Regarding claim 28, Vu further teaches the signal receiver wherein the secondary signal processor is implemented in a digital signal processor (DSP) (see figure 1, DSP 50).

Regarding claim 47, Poirier teaches a receiver (see figure 1):

applying a first controlled gain to the received communication signal to provide a scaled signal representative of the received signal (see figure 1, VGA 112, micro controller 105, col.7, ln.8-37);

controlling the first controlled gain to maintain the scaled signal within a second signal dynamic range (see figure 1, col.7, ln.8-37) ;

applying a second controlled gain to the scaled signal to provide an output signal representative of the received signal (see figure 1, VGA 115, micro controller 105, col.7, ln.8-37); and

controlling the second controlled gain to set the second controlled gain to a first gain value when a parameter associated with the scaled signal exceeds a threshold value, and to set the second controlled gain to a second gain value different from the first gain value when the signal parameter is less than the threshold value (see col.9, ln.13-35, col.10, ln.1-23).

It should be noticed that Poirier fails to clearly teach a transceiver configured to transmit and receive communication signals; and a digital signal processor (DSP) operatively coupled to the transceiver, the DSP comprising computer software code for processing a received communication signal having a first dynamic range. However, Vu

teaches such features (see figure 1, col.5, ln.15-67, col.2, ln.8-50) for a purpose of transmitting and receiving signals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of a transceiver configured to transmit and receive communication signals; and a digital signal processor (DSP) operatively coupled to the transceiver, the DSP comprising computer software code for processing a received communication signal having a first dynamic range, as taught by Vu, into view of Poirier in order to save cost and space in communication devices.

Regarding claim 48, Poirier further teaches the wireless communication device wherein the device is selected from the group consisting of a mobile communication device, a personal digital assistant (PDA), a cellular telephone, a two-way pager, and a wireless modem (see col.4, ln.40-50).

5. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poirier et al. (U.S. Patent No.: 6,625,433, hereinafter, "Poirier") in view of Baghdady (U.S. Patent No.: 3,909,725).

Regarding claim 44, Poirier teaches a signal receiver and method comprising (see figure 1):

a primary signal input configured to receive an input signal having a first signal dynamic range (see figure 1, input signal analog RF, col.5, ln.46-57), an intermediate signal output configured to provide a scaled signal representative of the input signal (see figure 1, 1st IF output at filter 110, col.5, ln.39-46), a primary variable-gain amplifier coupled to the signal input and the intermediate signal output (see figure 1, VGA 112,

col.5, ln.58-67), and a gain controller coupled to the primary amplifier and configured to control a gain applied by the primary amplifier to maintain the scaled signal within a second signal dynamic range (see figure 1, micro controller 105, col.7, ln.7-37); and a secondary signal input coupled to the intermediate signal output (see figure 1, IF input at VGA 115), a final signal output configured to provide an output signal representative of the input signal (see figure 1, final output at VGA 115), a secondary variable-gain amplifier coupled to the intermediate signal output and the final output (see figure 1, VGA 115, col.5, ln.58-67), and a gain controller coupled to the secondary amplifier (see figure 1, micro controller 105, col.7, ln.7-37) and configured to control a gain of the secondary amplifier to set the gain of the secondary amplifier to a first gain value when a parameter associated with the scaled signal exceeds a threshold value, and to set the gain of the secondary amplifier to a second gain value different from the first gain value when the signal parameter is less than the threshold value (see col.10, ln.1-23).

It should be noticed that Poirier fails to clearly teach the parameter is the limiter gain; the first gain value is unity; and the second gain value is the limiter gain. However, Baghdady teaches such features (see col.6, ln.44-52) for a purpose of controlling the gain in the system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of the parameter is the limiter gain; the first gain value is unity; and the second gain value is the limiter gain, as taught by Baghdady, into view of Poirier in order to improve the output voltage.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poirier et al. (U.S. Patent No.: 6,625,433, hereinafter, "Poirier") in view of Bizjak et al. (Pub. No.: U.S. 2003/0035549, hereinafter, "Bizjak") as applied to claim 1 above, and further in view of Kurihara (U.S. Patent No.: 6,731,703).

Regarding claim 6, Poirier and Biziak, in combination, fails to clearly teach the signal receiver wherein: the primary amplifier is an analog amplifier; the primary signal processor further comprises an analog to digital converter (ADC) coupled to an output of the primary amplifier and the intermediate signal output, and configured to provide the scaled signal as a digital signal; and the primary gain controller further comprises a digital to analog converter (DAC) coupled to the gain calculator and the primary amplifier, and configured to convert the primary gain control value from a digital signal to an analog signal. However, Kurihara teaches such features (see figure 3, col.1, ln.15-56) for a purpose of estimating the gain of amplifier.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of the signal receiver wherein: the primary amplifier is an analog amplifier; the primary signal processor further comprises an analog to digital converter (ADC) coupled to an output of the primary amplifier and the intermediate signal output, and configured to provide the scaled signal as a digital signal; and the primary gain controller further comprises a digital to analog converter (DAC) coupled to the gain calculator and the primary amplifier, and configured to convert the primary gain control value from a digital signal to an analog signal, as taught

by Kurihara, into view of Poirier and Biziak in order to improve noise interference level in communication system.

Allowable Subject Matter

7. Claims 8-18, 22-27, 34-35, 37-39, and 43 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In order to expedite the prosecution of this application, the applicants are also requested to consider the following references. Although Maurer et al. (U.S. Patent No. 5,048,076), Lorenz et al. (U.S. Patent No. 5,151,972), Weinstein et al. (U.S. Patent No. 6,650,635), and Fan (U.S. Patent No. 6,636,506) are not applied into this Office Action; they are also called to Applicants attention. They may be used in future Office Action(s). These references are also concerned for supporting the system and method for providing data and voice services on the telephone line by teaching an interface device having XDSL splitter in the central office.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Tuan A. Pham** whose telephone number is

Art Unit: 2643

(703) 305-4987. The examiner can normally be reached on Monday through Friday,
8:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Mr. Curtis Kuntz can be reached on (703) 305-4708 and

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Art Unit 2643
September 28, 2004
Examiner


CURTIS KUNTZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600